



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/541,890	04/13/2006	Peter O. Paulson	101382/104	7957
27220	7590	01/09/2008	EXAMINER	
BLAKE, CASSELS & GRAYDON, LLP			SHAH, SAMIR M	
45 O'CONNOR ST., 20TH FLOOR				
OTTAWA, ON K1P 1A4			ART UNIT	PAPER NUMBER
CANADA			2856	
			MAIL DATE	DELIVERY MODE
			01/09/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/541,890	PAULSON, PETER O.	
	Examiner	Art Unit	
	Samir M. Shah	2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 13 April 2006.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-18 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 11 July 2005 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 07/11/2005.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application
- 6) Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "32" has been used to designate both "infrared sensor" (page 15, line 9) and "temperature sensor" (page 17, line 16).
2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: dribble 44 (page 16, lines 10, 22).
3. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because of the following informalities:

- (a) As to page 1, line 16, delete "to some extend" and replace it with --to some extent--.
- (b) As to page 2, line 27, delete "asks as a" and replace it with --acts as a--.
- (c) As to page 5, line 23... page 6, line 20... page 18, line 24, delete "piezzoelectric" and replace it with --piezoelectric--.
- (d) As to page 8, line 10, delete "is done is done" and replace it with --is done--.
- (e) As to page 9, line 2, delete "events have shown" and replace it with --events has shown--.
- (f) As to page 9, line 17, delete "pipeline A" and replace it with --pipeline. A--.
- (g) As to page 10, line 4, delete "long the length" and replace it with --along the length--.
- (h) As to page 10, line 29, delete "from one and" and replace it with --from one another and--.
- (i) As to page 11, line 17, delete "either or a" and replace it with --either on a--.
- (j) As to page 11, line 25, delete "event temperature event" and replace it with --temperature event--.
- (k) As to page 19, line 1, delete "Figure 2" and replace it with --Figure 1--.
- (l) As to page 19, line 1, delete "helically would" and replace it with --helically wound--.
- (m) As to page 19, line 2, delete "keep it is place" and replace it with --keep it in its place--.

- (n) As to page 19, line 16, delete "that of figure 2" and replace it with --that of figure 1--.
- (o) As to page 19, lines 18 and 21, delete "vapour" and replace it with --vapor--.
- (p) As to page 19, line 21, delete "in the art., The" and replace it with --in the art. The--.

5. Appropriate correction is required.

Claim Objections

6. Claims 1, 3 are objected to because of the following informalities:
- (a) As to claim 1, line 5, delete "interest; and" and replace it with --interest, and--.
- (b) As to claim 1, lines 7-8, delete "temperature differs from the locations" and replace it with --temperature differs from the temperature of the locations--.
- (c) As to claim 1, lines 8-9, delete "amount; noting any such location as a location" and replace it with --amount and noting any such location as the location--.
- (d) As to claim 1, line 10, delete "when an acoustic event of interest and a temperature" and replace it with --if said acoustic event of interest and said temperature--.
- (e) As to claim 1, line 12, delete "of a leak" and replace it with --of said leak--.
- (f) As to claim 3, line 3, delete "oriented so that fluid" and replace it with --oriented in such a way that fluid--.
- (g) As to claims 4, 5, 9, 11-15, 17 and 18, delete "fibre" and replace it with --fiber--.

- (h) As to claim 7, line 4, delete "by such temperature" and replace it with --by said temperature--.
- (i) As to claim 7, line 7, delete "locations along it" and replace it with --locations along said pipeline--.
- (j) As to claim 7, line 10, delete "means for collating" and replace it with --means for collecting--.
- (k) As to claim 7, line 10, delete "output of such acoustic" and replace it with --output of said acoustic--.
- (l) As to claim 8, line 2, delete "above ground" and replace it with --above the ground--.
- (m) As to claim 10, line 3, delete "on such sensor" and replace it with --on said sensor--.
- (n) As to claim 15, line 2, delete "fibre optic distributed acoustic sensor" and replace it with --distributed fibre optic acoustic sensor--.
- (o) As to claim 15, line 3, delete "such fibre optic" and replace it with --said fibre optic--.
- (p) As to claim 16, line 2, delete "those events" and replace it with --those acoustic events--.

7. Appropriate correction is required.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 7-14 and 15-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As to independent claim 15, last two lines, the phrase "means for selecting from such analysis of acoustic events and their location of origin along the pipeline" renders the claim indefinite. It is unclear as to what selection criteria is being used or what particular "acoustic events" are being selected. Are all acoustic events selected? What is being selected from said analysis?

Moreover, as to independent claims 7 and 15, the preamble of the claims recites "sensing leaks in a pipeline" but the body of the claim lacks support for this recitation. How is the sensing of leaks performed? What part of the apparatus is used for sensing leaks? Dependent claims 8-14 and 16 are rejected for the same reasons as mentioned above.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent

granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claims 1-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Cain et al. (US Patent 6,834,556 B2 henceforth "Cain").

(a) As to claims 1, 2 and 6, Cain discloses a process (300) for locating a leak in a pipeline (200) partially above ground (abstract; figures 1-3; column 1, lines 13-16; column 12, lines 1-12), comprising:

(i) continuously sensing acoustic events which occur in proximity to the pipeline (200) and the location along the pipeline (200) at which they occur, selecting those consistent with a leak in the pipeline (200) or a collision with the pipeline (200) as acoustic events of interest, and noting the location or locations where they occur (figures 1-3; column 6, lines 16-19; column 7, lines 33-35, 64-67);

(ii) continuously sensing the temperature along the pipeline (200) (figures 1-3; column 3, lines 5-11; column 6, lines 15-21; column 9, lines 32-36);

(iii) noting any locations along the pipeline (200) where the temperature differs from the temperature of the locations adjacent to it by a predetermined amount, noting any such location as the location of a temperature event of interest (figures 1-3; column 3, lines 5-11);

(iv) when an acoustic event of interest and a temperature event of interest occur within a preselected time period at approximately the same location along the

pipeline (200), noting such location as the probable site of the leak (abstract; figures 1-3; column 7, lines 33-35; column 8, lines 40-56).

(b) As to claim 7, Cain discloses an apparatus for sensing leaks in a pipeline (200) (abstract; figures 1, 2), comprising:

- (i) temperature sensing means for determining temperature along the exterior of the pipeline (200) (figures 1, 2; column 3, lines 5-11; column 6, lines 15-21; column 9, lines 32-36);
- (ii) means for collecting data sensed by said temperature sensing means and for determining locations, if any, where the temperature of the exterior of the pipeline (200) differs by at least a predetermined amount from the temperature of the exterior of the pipeline (200) at adjacent locations along it (figures 1, 2; column 3, lines 12-29; column 12, lines 13-22);
- (iii) acoustic sensing means for detecting acoustic events occurring along the pipeline (200), and the location of such events (figures 1, 2; column 6, lines 15-24; column 7, lines 64-67); and
- (iv) means for collecting the output of said acoustic sensing means and said temperature sensing means to determine situations where there is an acoustic event, with a substantially contemporaneous temperature change occurring at the same location (figures 1, 2; column 8, lines 40-56; column 9, lines 32-40; column 13, line 63 - column 14, line 24).

(c) As to claim 8, Cain discloses the pipeline can be substantially above ground and visible from above, and the temperature sensing means can be mounted on an air or space-borne vehicle (figures 1-3; column 11, lines 31-36; column 14, lines 12-15).

(d) As to claims 4, 11-15, 17 and 18, Cain discloses an apparatus for sensing leaks in a pipeline (200), comprising:

(i) a fibre optic distributed acoustic sensor (figures 1, 2; column 6, lines 15-24; column 7, lines 64-67; column 15, lines 50-52; column 16, lines 1-7);

(ii) means for analyzing the data output of said fibre optic acoustic sensor resulting from acoustic events impinging on it (figures 1, 2; column 6, lines 15-24; column 7, lines 64-67);

(iii) means for selecting acoustic events from said analysis and the location of the selected acoustic events along the pipeline (200) (figures 1, 2; column 6, lines 15-24; column 7, lines 64-67; column 8, lines 40-56; column 9, lines 32-40; column 13, line 63 - column 14, line 24).

(e) As to claims 5 and 9, Cain discloses the sensing of temperature being carried out by a distributed fibre optic temperature sensor (figures 1, 2; column 3, lines 5-11; column 6, lines 15-21; column 9, lines 32-36; column 15, lines 50-52; column 16, lines 1-7).

(f) As to claims 3 and 10, Cain discloses, "attaching a sensor suite of one or more sensors to an outer skin of the [pipeline] and providing power for the sensor suite based on a temperature difference between a fluid temperature of a contained fluid inside the [pipeline] and an ambient temperature outside the [pipeline]". In order to measure/detect the temperature of a contained fluid inside the pipeline, the sensing of the temperature along the pipeline would have to inherently be carried out with the sensing apparatus/distributed temperature sensors oriented (below the pipeline (200) and substantially adjacent to it) so that fluid escaping/leaking from the pipeline is likely to contact it (column 3, lines 5-11; column 7, lines 33-35).

(g) As to claim 16, Cain discloses means for selecting as anomalous events those events which appear to have their origin in a single short length of the pipeline (200) (column 8; lines 40-56).

Conclusion

12. The prior art made of record and not relied upon, cited in the attached 892 form, is considered pertinent to applicant's disclosure.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samir M. Shah whose telephone number is (571) 272-2671. The examiner can normally be reached on Monday-Friday 9:30 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Samir Shah
Samir M. Shah
Art Unit 2856
12/28/2007

Hezron E. Williams
HEZRON WILLIAMS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800